

US EPA ARCHIVE DOCUMENT

## **Responsiveness Summary for Springs Coast:**

- Total Maximum Daily Load for Dissolved Oxygen in Pithlachascotee River (WBID 1409)

EPA Region 4

March 2013

### General response to comments regarding status of NNC in Florida:

Commenters on this TMDL and other proposed TMDLs addressing nutrients in Florida have raised questions about whether and how these TMDLs are impacted by ongoing activities to establish numeric nutrient criteria in Florida.

In 1979, FDEP adopted narrative criteria for nutrients applicable to waters designated as Class I (Potable Water Supply), Class II (Shellfish Propagation or Harvesting), and Class III (Recreation and for propagation and maintenance of a healthy, well-balanced population of fish and wildlife). See paragraphs 62-302.530(47)(a) and (b), F.A.C. FDEP recently adopted numeric nutrient criteria (NNC) for many Class I, II, and III waters in the state, including streams. See sections 62-302.531 and .532, F.A.C. The State's NNC numerically interpret part of the state narrative criteria for nutrients, at paragraph 62-302.530(47)(b), F.A.C., which provides that nutrients may not cause an imbalance of flora and fauna. FDEP submitted its NNC to EPA for review pursuant to section 303(c) of the CWA and on November 30, 2012, EPA approved those criteria as consistent with the requirements of the CWA. The state criteria, however, are not yet effective for state law purposes.

Also, in November 2010, EPA promulgated numeric nutrient criteria for Class III inland waters in Florida, including streams, pursuant to a Consent Decree in Florida Wildlife Federation, et. al. v. EPA, No. 4:08-cv-00324-RH-WCS (N.D. Fla.). On February 18, 2012, the streams criteria were remanded back to EPA by the District Court for further explanation. On November 30, 2012, EPA re-proposed its stream NNC for those flowing waters not covered by Florida's NNC rule. Those criteria have not been finalized.

Therefore, for streams in Florida, the applicable nutrient water quality standard for CWA purposes remains the narrative criteria. While FDEP's nutrient rule is not yet effective for state law purposes, EPA believes that FDEP's numeric nutrient criteria represent FDEP's most recent interpretation of paragraph 62-302.530(47)(b), F.A.C. Also, the other part of the state narrative criteria for nutrients, at paragraph 62-302.530(47)(a), F.A.C., remains applicable to all Class I, II, and III waters in Florida.<sup>1</sup> Paragraph 62-302.530(47)(a) requires nutrients to be limited as necessary to prevent violations of other Florida water quality standards.

In developing the TMDLs in this response summary, EPA considered both paragraphs 62-302.530(47)(a) and (b). The nutrient end point for this TMDL represents the level of nutrients that will prevent nutrients from causing or contributing to nonattainment of the State's dissolved oxygen criteria pursuant to paragraph 62-302.530(47)(a). That endpoint, which requires that nutrients be reduced to natural background levels, was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

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<sup>1</sup> Paragraph 62-302.530(47)(a), F.A.C. will remain applicable to all Class I, II, and III waters even after FDEP's nutrient rule becomes effective. See subsection 62-302.531(1), F.A.C.

# 1 GENERAL COMMENTS

## Comment ID S0105.001.001

**Author Name:** Garrett Michael

**Organization:** PASCO COUNTY PUBLIC WORKS DEPT., STORMWATER MANAGEMENT DIVISION

**Issue Category:** 1

**SUMMARY OF FINDINGS:** 1. While the system does show episodes of low DO values, Chlorophyll a (Chl a) levels in the system are not elevated [ $<20$  micrograms per liter ( $\mu\text{g/L}$ )]. Additionally, biological assessments indicate that generally, these systems are healthy even with the low DO values. 2. The lowest DO measurements were recorded during an extended dry period beginning in 2006 and ending mid to late 2009 according to U.S. Geological Survey (USGS) records. USGS data indicate that the waterbody segment (WBID) experiences extended periods of zero flow at the USGS monitoring station near New Port Richey. It is difficult to assess the conditions under which the DO measurements were made because all data from the 12 monitoring stations located in WBID 1409 are presented on one graph, and flow information is not presented in the report. 3. There is a significant amount of information missing from the TMDL report regarding how the modeling was performed and, as such, a complete review of the model and its assumptions is not possible. 4. The U.S. Environmental Protection Agency (EPA) prediction of "natural" condition loadings and in-stream nutrient concentrations is a critical aspect to this TMDL. More detail assessment of the reasonableness of the "natural" conditions needs to be provided. 5. Model results indicate similar DO conditions in the existing condition and the "natural" condition that incorporates the proposed TMDL load reductions. 6. At present, Florida is in the process of revising its DO criteria. While it is recognized at this time that EPA cannot assess against these criteria, and must utilize the existing criteria, some acknowledgement of the determinations that have been made and recorded by the Florida Department of Environmental Protection (FDEP) that the DO criteria are at issue and are being modified should be put into the TMDL report.

**DETAILED COMMENTS:** 1. The TMDL discusses that the WBID is considered impaired for DO but does not discuss what the causative agent is other than presenting those conditions that might cause low DO. Existing condition biochemical oxygen demand (BOD) levels in the system (Figure 5.2) are generally 2.0 mg/L or below. FDEP generally does not consider BOD a causative parameter in low DO conditions when levels are below 2.0 mg/L (generally detection limit is at 2.0 mg/L). Examination of the Chl a data indicates the Chl a levels are generally below 5.0  $\mu\text{g/L}$ , with a maximum value of 16  $\mu\text{g/L}$ . The following plot shows the Chl a levels measured. Given that FDEP identifies annual average Chl a levels in-stream greater than 20  $\mu\text{g/L}$  as candidates for impairment, the Chl a levels here would not be deemed "high." 2. The data analysis presented for total nitrogen (TN) and total phosphorus (TP) does not indicate excessive nutrients are present. The mean and geometric mean for TN were 1.09 mg/L and 0.97 mg/L, respectively. The mean and geometric mean for TP were 0.07 mg/L and 0.06 mg/L, respectively. This compares to the proposed inland numeric nutrient criteria for peninsular Florida of 1.54 mg/L for TN and 0.12 mg/L for TP. 3. Pasco County has maintained a monitoring station at Little Road which is located in the lower portion of the Pithlachascotee River. The TN and TP data from this station supports the findings from the comment above that the TN and TP data are not elevated. The annual geomeans for the data range from around 0.5 mg/L to 1.1 mg/L for TN and 0.05 to 0.07 for TP. 4. One aspect of many Florida streams is that they can have high color and associated high natural organic carbon levels. These systems have been documented by both FDEP and EPA as having low DO at times. The report indicates that this WBID has a high percentage of forested areas and wetlands, particularly in the headwaters area, which would contribute to a high color or black water system. Prior to mandating large reductions in nutrients, EPA needs to provide assurance that the low DO values are the result of anthropogenic influences and not simply a natural condition. The data from the Pasco County monitoring support this assertion, with the times where TN levels are elevated generally associated with high color and high levels of organic nitrogen. The percent reductions identified through the "natural" condition loading modeling simply do not make sense after looking at the TN and TP data. It is important when developing TMDLs that regardless of what models may show, if the reductions are not supported by logic and an examination of the available data, they should be reconsidered. 5. The lowest DO measurements were recorded during an extended dry period beginning in

2006 and ending mid to late 2009, according to USGS records. USGS data indicate that the WBID experiences extended periods of zero flow at the USGS monitoring station near New Port Richey. It is difficult to assess the conditions under which the DO measurements were made because all data from the 12 monitoring stations located in WBID 1409 are presented on one graph and flow information is not presented in the report. 6. The data analyses presented appear to indicate that the systems may be healthy and meeting their designated uses and that the low DO levels may be natural. This needs further investigation.

MODELING: 1. There is a USGS flow gage (02310300) located at the western end of WBID 1409. In the report, there is no presentation of the comparison of the flow measured at the USGS gage with the model simulations nor is flow calibration discussed. This needs to be presented to demonstrate the model is adequately simulating the flow conditions. 2. The report indicates that LSPC provided tributary flows and temperature to the EFDC estuary models and tributary water quality concentrations to WASP7 estuary models. No model inputs or coefficients were presented for any of these models. The report needs to provide a complete and comprehensive presentation of what went into the development of the models, including all physical, hydrologic, and chemical inputs and all relevant model coefficients. Referring to the models described in the recently completed Technical Support Document for EPA's Proposed Rule for Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters (July 2012) is not sufficient because the models described in that document were modified for this application. 3. The report indicates that the Pithlachascotee River basin model was developed from the larger scale Crystal Watershed model. Other than stating the relatively large subwatersheds in the Crystal Watershed Model were re-delineated using the USGS National Hydrography Dataset (NHD) catchments, with only the subwatersheds draining to the Pithlachascotee River used to evaluate loadings in the Pithlachascotee River, no other modifications were discussed. 4. The report states that when re-delineated to the small scale, it was determined that loadings from the original Crystal model were low in the Pithlachascotee River. Loadings from the watershed were increased for the Pithlachascotee River modeling effort for successful calibration. Given that no flow calibration is discussed or presented and no loading parameters are presented, it is not possible to evaluate the loading calibration. The "calibrated" surface water event mean concentrations (EMCs), as well as river flows and baseflow concentrations by land use, need to be provided to allow proper review of the model calibration. 5. The WASP model segmentation and EFDC grid needs to be overlain upon a map or aerial of the watersheds. There is no discussion of how model segmentation and grid setup were performed nor what data were used in their construction. 6. The report presents the results of the natural condition simulations where anthropogenic land uses were changed to natural conditions. The changes in loads represented a 63 percent reduction in TN, a 70 percent reduction in TP and a 33 percent reduction in BOD. The model-predicted natural condition is arrived at through the assumption that the EMCs represent the natural loading to this system. Given some of the earlier discussions relative to the health of the system, and its "natural" condition, it is important for EPA to clearly show that the identified "natural" condition loadings and in-stream concentrations make sense. 7. The resultant DO time series for the existing and natural conditions are presented in the following graphs. Inspection of the graphs indicates that the time series are very similar. Also, the "calibrated" model appears to be consistently underestimating cooler season DO as compared to observed values. As discussed previously, the report does not provide any details related to model construction or calibration, so it is not possible to evaluate this further. Given the similarities in the time series and DO values from Tables 7.1 and 7.3 (5.96 mg/L for the existing condition, 6.06 mg/L for the natural condition), it appears that the nutrient and BOD reductions proposed make little if any difference in improving DO conditions. This may indicate a DO condition that is natural. This needs further investigation. 8. The model shows BOD concentrations for the existing condition drop to 1.0 mg/L, and the BOD concentrations for natural condition drop to 0.84 mg/L. These are very low values to simulate and are below detection limits. There is no identification if this is ultimate BOD or BOD5. Since the detection limit for BOD5 is generally around 2.0 mg/L and FDEP identifies thresholds for streams as having BOD problems when measurements are above 2.0 mg/L, these simulations are at such low values as to be unreasonable.

## Response

The comments from the Pasco County Public Work Departments are duplicates of the comments from the Florida Department of Transportation (FDOT). Please refer to the comment responses to FDOT.

## 1.A LISTING

### 3 WATER QUALITY ASSESSMENT

#### Comment ID S0101.001.007

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 3

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409). Plot image in original comment letter.>>

1. The TMDL discusses that the WBID is considered impaired for DO but does not discuss what the causative agent is other than presenting those conditions that might cause low DO. Existing condition biochemical oxygen demand (BOD) levels in the system (Figure 5.2) are generally 2.0 mg/L or below. FDEP generally does not consider BOD a causative parameter in low DO conditions when levels are below 2.0 mg/L (generally detection limit is at 2.0 mg/L). Examination of the Chl *a* data indicates the Chl *a* levels are generally below 5.0 µg/L, with a maximum value of 16 µg/L. The following plot shows the Chl *a* levels measured. Given that FDEP identifies annual average Chl *a* levels in-stream greater than 20 µg/L as candidates for impairment, the Chl *a* levels here would not be deemed "high."

#### Response

EPA recently approved FDEP's numeric nutrient rule, which interprets the first part of the state narrative nutrient criteria, at paragraph 62-302.530(47)(b). Florida adopted TN and TP thresholds along with a suite of numeric response variables designed to ensure that nutrient concentrations provide for a well balanced population of flora and fauna. The response variables adopted to measure flora and fauna nutrient response include chlorophyll *a*, periphyton coverage (measured via RPS), nuisance macrophyte growth (measures via LVS), algal taxa dominance, and evaluation of macroinvertebrate health through application of the state's stream condition index. The commenter cites low chlorophyll *a* concentrations. While EPA notes that there are several instances of elevated chlorophyll concentrations in the impaired waterbodies, the data do not suggest a chronic overgrowth of phytoplankton algae. However, that data does not address the other metrics of Florida uses to demonstrate that streams are biologically healthy in terms of both flora and fauna as set out above.

Even if all floral and faunal measures indicate balanced flora and fauna, however, paragraph the other part of the state narrative criteria for nutrients, at paragraph 62-302.530(47)(a), F.A.C., remains applicable to all Class I, II, and III waters in Florida.<sup>[1]</sup> Paragraph 62-302.530(47)(a) requires nutrients to be limited as necessary to prevent violations of other Florida water quality standards. The waterbodies addressed in this TMDL are all impaired based on Florida's applicable water quality criteria for dissolved oxygen. There are several factors that may affect the concentration of dissolved oxygen in a waterbody. Among these factors is anthropogenic over-enrichment of nutrients (i.e. nitrogen and phosphorus) and oxygen-demanding substances (quantified as biochemical oxygen demand). Nutrient levels affect DO concentrations directly and indirectly. The process of nitrification, in which bacteria convert ammonia-nitrogen to nitrate-nitrogen, directly consumes oxygen from the water. Indirect effects of excessive nutrient loading involve

<sup>[1]</sup> Paragraph 62-302.530(47)(a), F.A.C. will remain applicable to all Class I, II, and III waters even after FDEP's nutrient rule becomes effective. See subsection 62-302.531(1), F.A.C.

over-stimulation of aquatic plant growth, which leads to exacerbated diurnal swings in DO as the plants photosynthesize during daylight hours, and respire at night. Replenishment of oxygen levels may be inhibited if excessive growth of aquatic plants above the water surface blocks sunlight from reaching submerged vegetation, reducing their ability to photosynthesize. Decomposition of algal and other types of organic matter, such as dead plants and animals, also uses up DO from the water.

### 3.A.1 NUTRIENTS

#### Comment ID S0101.001.008

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 3.a.1

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

2. The data analysis presented for total nitrogen (TN) and total phosphorus (TP) does not indicate excessive nutrients are present. The mean and geometric mean for TN were 1.09 mg/L and 0.97 mg/L, respectively. The mean and geometric mean for TP were 0.07 mg/L and 0.06 mg/L, respectively. This compares to the proposed inland numeric nutrient criteria for peninsular Florida of 1.54 mg/L for TN and 0.12 mg/L for TP.

#### Response

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

#### Comment ID S0101.001.009

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 3.a.1

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

3. Pasco County has maintained a monitoring station at Little Road which is located in the lower portion of the Pithlachascotee River. The TN and TP data from this station supports the findings from the comment above that the TN and TP data are not elevated. The annual geomeans for the data range from around 0.5 mg/L to 1.1 mg/L for TN and 0.05 to 0.07 for TP.

#### Response

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen,



EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

## 3.A.2 DISSOLVED OXYGEN

### Comment ID S0101.001.001

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 3.a.2

<<The following comment was made in reference to the TMDLs for the Pithlachascotee River (WBID 1409) >>

1. While the system does show episodes of low DO values, Chlorophyll a (Chl a) levels in the system are not elevated [ $<20$  micrograms per liter ( $\mu\text{g/L}$ )]. Additionally, biological assessments indicate that generally, these systems are healthy even with the low DO values.

#### Response

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

### Comment ID S0101.001.002

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 3.a.2

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

2. The lowest DO measurements were recorded during an extended dry period beginning in 2006 and ending mid to late 2009 according to U.S. Geological Survey (USGS) records. USGS data indicate that the waterbody segment (WBID) experiences extended periods of zero flow at the USGS monitoring station near New Port Richey. It is difficult to assess the conditions under which the DO measurements were made because all data from the 12 monitoring stations located in WBID 1409 are presented on one graph, and flow information is not presented in the report.

#### Response

The USGS monitoring station near New Port Richey experienced periods of zero flow in the late spring and early summer several times during the modeling period. However, the USGS gage is located approximately 7 miles upstream of the outlet of WBID 1409, and most of the monitoring stations are located downstream of this gage location. Additionally, low flow periods must be considered when



assessing waterbodies and developing TMDLs because they represent critical periods within the waterbodies.

## Comment ID S0101.001.010

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 3.a.2

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

4. One aspect of many Florida streams is that they can have high color and associated high natural organic carbon levels. These systems have been documented by both FDEP and EPA as having low DO at times. The report indicates that this WBID has a high percentage of forested areas and wetlands, particularly in the headwaters area, which would contribute to a high color or black water system. Prior to mandating large reductions in nutrients, EPA needs to provide assurance that the low DO values are the result of anthropogenic influences and not simply a natural condition. The data from the Pasco County monitoring support this assertion, with the times where TN levels are elevated generally associated with high color and high levels of organic nitrogen. The percent reductions identified through the "natural" condition loading modeling simply do not make sense after looking at the TN and TP data. It is important when developing TMDLs that regardless of what models may show, if the reductions are not supported by logic and an examination of the available data, they should be reconsidered.

### Response

EPA agrees with FDEP findings that high organic levels are correlated with color and may be indicative of natural blackwater systems. However, the downstream portion of the Pithlachascotee River, where the majority of water quality stations are located, is dominated by developed urban land. Given the presence of anthropogenic sources of pollution that can cause or contribute to low dissolved oxygen, it is difficult to demonstrate that those instances when Pithlachascotee River did not meet the DO standard are entirely natural, and not caused or exacerbated by pollutants.

## Comment ID S0201.001.001

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 3.a.2

1. While the system does show episodes of low DO values, Chlorophyll a (Chl a) levels in the system are not elevated [ $<20$  micrograms per liter ( $\mu\text{g/L}$ )]. Additionally, biological assessments indicate that generally, these systems are healthy even with the low DO values.

### Response

There are several instances of elevated chlorophyll concentrations in the impaired waterbodies. Although the data do not suggest a chronic overgrowth of phytoplankton algae, it is important to interpret the data with the understanding that measuring chlorophyll concentrations in a water sample only captures phytoplankton, the free-floating algae, and will not capture other types such as attached algae (periphyton), algae growing on bottom sediments (benthic), and other aquatic plants (macrophytes).

There are several factors that may affect the concentration of dissolved oxygen in a waterbody. Among these factors is anthropogenic

over-enrichment of nutrients (i.e. nitrogen and phosphorus) and oxygen-demanding substances (quantified as biochemical oxygen demand). Nutrient levels affect DO concentrations directly and indirectly. The process of nitrification, in which bacteria convert ammonia-nitrogen to nitrate-nitrogen, directly consumes oxygen from the water. Indirect effects of excessive nutrient loading involve over-stimulation of aquatic plant growth, which leads to exacerbated diurnal swings in DO as the plants photosynthesize during daylight hours, and respire at night. Replenishment of oxygen levels may be inhibited if excessive growth of aquatic plants above the water surface blocks sunlight from reaching submerged vegetation, reducing their ability to photosynthesize. Decomposition of algal and other types of organic matter, such as dead plants and animals, also uses up DO from the water.

## Comment ID S0205.001.001

**Author Name:** Garrett Michael

**Organization:** PASCO COUNTY PUBLIC WORKS DEPT., STORMWATER MANAGEMENT DIVISION

**Issue Category:** 3.a.2

1. While the system does show episodes of low DO values, Chlorophyll a (Chl a) levels in the system are not elevated [ $<20$  micrograms per liter ( $\mu\text{g/L}$ )]. Additionally, biological assessments indicate that generally, these systems are healthy even with the low DO values.

### Response

Please see Response to Comment S0201.001.001.

## Comment ID S0205.001.002

**Author Name:** Garrett Michael

**Organization:** PASCO COUNTY PUBLIC WORKS DEPT., STORMWATER MANAGEMENT DIVISION

**Issue Category:** 3.a.2

2. There is a significant amount of information missing from the TMDL report regarding how the modeling was performed and, as such, a complete review of the model and its assumptions is not possible.

### Response

Please see Response to Comment S0201.001.002.

## 3.B GENERAL/MISCELLANEOUS

## Comment ID S0101.001.012

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 3.b

<<The following comment was made in reference to the TMDLs for the Pithlachascotee River (WBID 1409).>>

6. The data analyses presented appear to indicate that the systems may be healthy and meeting their designated uses and that the low

DO levels may be natural. This needs further investigation.

#### **Response**

EPA agrees that low DO is in part a natural phenomenon that occurs within this system. However, the natural condition scenario indicates that a significant portion of the nutrient and BOD loads within the system are from anthropogenic sources. Please see Response to Comment S0101.001.001, S0101.001.007, and S0101.001.008.

### **Comment ID S0201.001.011**

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 3.b

6. The data analyses presented appear to indicate that the systems may be healthy and meeting their designated use and that the low DO levels may be natural. This needs further investigation.

#### **Response**

EPA agrees that low DO is in part a natural phenomenon that occurs within this system. However, the natural condition scenario indicates that a significant portion of the nutrient and BOD loads within the system are from anthropogenic sources. Please see Response to Comment S0201.001.001 and S0201.001.007.

### **Comment ID S0205.001.012**

**Author Name:** Garrett Michael

**Organization:** PASCO COUNTY PUBLIC WORKS DEPT., STORMWATER MANAGEMENT DIVISION

**Issue Category:** 3.b

7. The data analyses presented appear to indicate that the systems may be healthy and meeting their designated use and that the low DO levels may be natural. This needs further investigation.

#### **Response**

Please see Response to Comment S0201.001.011.

## **4.C FDEP PROPOSED WQS**

### **Comment ID S0101.001.006**

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 4.c

<<The following comment was made in reference to the TMDLs for the Pithlachascotee River (WBID 1409).>>

6. At present, Florida is in the process of revising its DO criteria. While it is recognized at this time that EPA cannot assess against these criteria, and must utilize the existing criteria, some acknowledgement of the determinations that have been made and recorded by

the Florida Department of Environmental Protection (FDEP) that the DO criteria are at issue and are being modified should be put into the TMDL report.

#### **Response**

As mentioned above, EPA cannot develop a new DO standard within the context of the TMDL, so the TMDL must target the adopted standards relevant to impaired parameters until such time as a new water quality standard is in place. The TMDL must be established pursuant to the schedule of EPA's commitments in the 1998 Consent Decree in the Florida TMDL lawsuit (Florida Wildlife Federation, et al. v. Carol Browner, et al., Civil Action No. 4: 98CV356-WS, 1998). However, the TMDL may be revised if different water quality standards are adopted, or if additional data or information becomes available. Additional language has been added to the TMDL report indicating that TMDL can be reviewed should FDEP revise the DO criteria.

### **Comment ID S0201.001.005**

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 4.c

5. At present, Florida is in the process of revising its DO criteria. While it is recognized at this time that EPA cannot assess against these criteria, and must utilize the existing criteria, some acknowledgement of the determinations that have been made and recorded by FDEP that the DO criteria are at issue and are being modified should be put into the TMDL report.

#### **Response**

As mentioned above, EPA cannot develop a new DO standard within the context of the TMDL, so the TMDL must target the adopted standards relevant to impaired parameters until such time as a new water quality standard is in place. The TMDL must be established pursuant to the schedule of EPA's commitments in the 1998 Consent Decree in the Florida TMDL lawsuit (Florida Wildlife Federation, et al. v. Carol Browner, et al., Civil Action No. 4: 98CV356-WS, 1998). However, the TMDL may be revised if different water quality standards are adopted, or if additional data or information becomes available. Additional language has been added to the TMDL report indicating that TMDL can be reviewed should FDEP revise the DO criteria.

### **Comment ID S0205.001.005**

**Author Name:** Garrett Michael

**Organization:** PASCO COUNTY PUBLIC WORKS DEPT., STORMWATER MANAGEMENT DIVISION

**Issue Category:** 4.c

5. At present, Florida is in the process of revising its DO criteria. While it is recognized at this time that EPA cannot assess against these criteria, and must utilize the existing criteria, some acknowledgement of the determinations that have been made and recorded by FDEP that the DO criteria are at issue and are being modified should be put into the TMDL report.

#### **Response**

As mentioned above, EPA cannot develop a new DO standard within the context of the TMDL, so the TMDL must target the adopted standards relevant to impaired parameters until such time as a new water quality standard is in place. The TMDL must be established pursuant to the schedule of EPA's commitments in the 1998 Consent Decree in the Florida TMDL lawsuit (Florida Wildlife Federation, et al. v. Carol Browner, et al., Civil Action No. 4: 98CV356-WS, 1998). However, the TMDL may be revised if different water quality

standards are adopted, or if additional data or information becomes available. Additional language has been added to the TMDL report indicating that TMDL can be reviewed should FDEP revise the DO criteria.

## 5 SOURCES OF POLLUTANTS

### 5.B POINT SOURCES (MS4S)

#### Comment ID S0401.001.025

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 5.b

1. FDOT should to be listed as a co-permittee in Table 6.2. The way the table presents it implies that FDOT holds the municipal separate storm sewer system (MS4) permit.

#### Response

Comment noted. This has been corrected in the TMDL report.

## 6 ANALYTICAL APPROACH

### 6.B WATERSHED MODELING ASSUMPTIONS

#### Comment ID S0101.001.015

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.b

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

3. The report indicates that the Pithlachascotee River basin model was developed from the larger scale Crystal Watershed model. Other than stating the relatively large subwatersheds in the Crystal Watershed Model were re-delineated using the USGS National Hydrography Dataset (NHD) catchments, with only the subwatersheds draining to the Pithlachascotee River used to evaluate loadings in the Pithlachascotee River, no other modifications were discussed.

#### Response

The smaller, Pithlachascotee model utilized the same data inputs as the larger scale Crystal Watershed model. The only change regarding model set-up involved the re-delineation, therefore no additional discussion of model modifications was necessary.

### 6.C WATERSHED MODEL CALIBRATION

#### Comment ID S0101.001.013

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.c

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

1. There is a USGS flow gage (02310300) located at the western end of WBID 1409. In the report, there is no presentation of the comparison of the flow measured at the USGS gage with the model simulations nor is flow calibration discussed. This needs to be presented to demonstrate the model is adequately simulating the flow conditions.

#### **Response**

The hydrology calibration and discussion of flow calibration was presented in the larger Crystal watershed report. No changes to flow calibration were made. However, a plot of modeled and measured flow at USGS gage 02310300 has been included in the report.

### **Comment ID S0101.001.016**

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.c

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

4. The report states that when re-delineated to the small scale, it was determined that loadings from the original Crystal model were low in the Pithlachascotee River. Loadings from the watershed were increased for the Pithlachascotee River modeling effort for successful calibration. Given that no flow calibration is discussed or presented and no loading parameters are presented, it is not possible to evaluate the loading calibration. The "calibrated" surface water event mean concentrations (EMCs), as well as river flows and baseflow concentrations by land use, need to be provided to allow proper review of the model calibration.

#### **Response**

There was no adjustments to the flow calibration, therefore no changes to the flow calibration were presented. The water quality calibration that resulted as adjustments to the model are presented in Section 7.2.1. The model, including its parameterization, is available for review as part of the administrative record.

## **6.F TMDL MODELING SCENARIOS**

### **Comment ID S0101.001.005**

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.f

<<The following comment was made in reference to the TMDLs for the Pithlachascotee River (WBID 1409) >>

5. Model results indicate similar DO conditions in the existing condition and the "natural" condition that incorporates the proposed

TMDL load reductions.

#### **Response**

This comment has been noted. In the original Anclote River system TMDL the incorrect natural condition run scenario was presented. The correct natural condition run reduces the SOD based upon the changes in chlorophyll a, a method that has been documented by the FDEP. These changes have been made, and report has been updated with the corrected figures. These figures show that there is a change in the dissolved oxygen levels within the impaired WBIDs.

## **Comment ID S0101.001.019**

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.f

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409). Images in original comment letter.>>

7. The resultant DO time series for the existing and natural conditions are presented in the following graphs. Inspection of the graphs indicates that the time series are very similar. Also, the "calibrated" model appears to be consistently underestimating cooler season DO as compared to observed values. As discussed previously, the report does not provide any details related to model construction or calibration, so it is not possible to evaluate this further. Given the similarities in the time series and DO values from Tables 7.1 and 7.3 (5.96 mg/L for the existing condition, 6.06 mg/L for the natural condition), it appears that the nutrient and BOD reductions proposed make little if any difference in improving DO conditions. This may indicate a DO condition that is natural. This needs further investigation.

#### **Response**

The model was developed to represent the overall trend of DO that occurred in the Pithlachascotee River. Additionally, the model does underestimate DO concentrations during the cooler periods, however, it is able to correctly predict low DO concentrations during the warmer periods, which is the critical period in the watershed. EPA agrees that DO is a naturally occurring phenomenon in the Pithlachascotee River. However, by reducing nutrients and BOD in the watershed there is an increase DO, specifically in values less than 5 mg/L. For this reason, EPA has set the TMDL target to the natural conditions. Please see Response to Comment S0101.001.008 for additional information.

## **Comment ID S0201.001.004**

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 6.f

4. Model results indicate similar DO conditions in the existing condition and the "natural" condition that incorporates the proposed TMDL load reductions.

#### **Response**

This comment has been noted. In the original TMDL the incorrect natural condition run scenario was presented. The correct natural



condition run reduces the SOD based upon the changes in chlorophyll a, a method that has been documented by the FDEP. These changes have been made, and report has been updated with the corrected figures. These figures show that there is a change in the dissolved oxygen levels within the impaired WBIDs.

## **Comment ID S0205.001.004**

**Author Name:** Garrett Michael

**Organization:** PASCO COUNTY PUBLIC WORKS DEPT., STORMWATER MANAGEMENT DIVISION

**Issue Category:** 6.f

4. Model results indicate similar DO conditions in the existing condition and the "natural" condition that incorporates the proposed TMDL load reductions.

### **Response**

Please see Response to Comment S0201.001.004

## **6.F.1 NATURAL CONDITION**

## **Comment ID S0101.001.004**

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.f.1

<<The following comment was made in reference to the TMDLs for the Pithlachascotee River (WBID 1409).>>

4. The U.S. Environmental Protection Agency (EPA) prediction of "natural" condition loadings and in-stream nutrient concentrations is a critical aspect to this TMDL. More detail assessment of the reasonableness of the "natural" conditions needs to be provided.

### **Response**

EPA's assessment of ambient data confirmed that the WBID does not meet the applicable DO standard. Since EPA cannot demonstrate that the reason for this is entirely natural, and since the analysis could not identify a pollutant loading scenario under which the Pithlachascotee River could meet the 5.0 mg/l DO standard, EPA considers that the waterbody does not have assimilative capacity for pollutant loads beyond those naturally occurring in the watershed. As such, the TMDL analysis focused on quantifying what watershed pollutant loads would exist with minimal to no impact from anthropogenic sources. To simulate the natural condition scenario, all anthropogenic land uses (urban/impervious, agriculture, transportation/utilities) were reverted to forest in the watershed model and the associated concentrations for nitrogen, phosphorus and BOD were used in the analysis.

## **Comment ID S0101.001.018**

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.f.1

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

6. The report presents the results of the natural condition simulations where anthropogenic land uses were changed to natural conditions. The changes in loads represented a 63 percent reduction in TN, a 70 percent reduction in TP and a 33 percent reduction in BOD. The model-predicted natural condition is arrived at through the assumption that the EMCs represent the natural loading to this system. Given some of the earlier discussions relative to the health of the system, and its "natural" condition, it is important for EPA to clearly show that the identified "natural" condition loadings and in-stream concentrations make sense.

#### **Response**

Please see the Response to Comment is S0101.001.004 and S0101.001.008.

### **Comment ID S0201.001.003**

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 6.f.1

3. The U.S. Environmental Protection Agency (EPA) prediction of "natural" condition loadings and in-stream nutrient concentrations is a critical aspect to this TMDL. More detail assessment of the reasonableness of the "natural" conditions needs to be provided.

#### **Response**

EPA's assessment of ambient data confirmed that the WBID does not meet the applicable DO standard. Since EPA cannot demonstrate that the reason for this is entirely natural, and since the analysis could not identify a pollutant loading scenario under which the Pithlachascotee River could meet the 5.0 mg/l DO standard, EPA considers that the waterbody does not have assimilative capacity for pollutant loads beyond those naturally occurring in the watershed. As such, the TMDL analysis focused on quantifying what watershed pollutant loads would exist with minimal to no impact from anthropogenic sources. To simulate the natural condition scenario, all anthropogenic land uses (urban/impervious, agriculture, transportation/utilities) were reverted to forest in the watershed model and the associated concentrations for nitrogen, phosphorus and BOD were used in the analysis.

### **Comment ID S0205.001.003**

**Author Name:** Garrett Michael

**Organization:** PASCO COUNTY PUBLIC WORKS DEPT., STORMWATER MANAGEMENT DIVISION

**Issue Category:** 6.f.1

3. The U.S. Environmental Protection Agency (EPA) prediction of "natural" condition loadings and in-stream nutrient concentrations is a critical aspect to this TMDL. More detail assessment of the reasonableness of the "natural" conditions needs to be provided.

#### **Response**

Please see Response to Comment S0201.001.003.

### **Comment ID S0401.001.004**

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 6.f.1

4. The U.S. Environmental Protection Agency (EPA) prediction of "natural" condition loadings and in-stream nutrient concentrations is a critical aspect to this TMDL. More detail assessment of the reasonableness of the "natural" conditions needs to be provided.

**Response**

EPA's assessment of ambient data confirmed that the WBID does not meet the applicable DO standard. Since EPA cannot demonstrate that the reason for this is entirely natural, and since the analysis could not identify a pollutant loading scenario under which the impaired WBIDs could meet the 5.0 mg/l DO standard, EPA considers that the waterbody does not have assimilative capacity for pollutant loads beyond those naturally occurring in the watershed. As such, the TMDL analysis focused on quantifying what watershed pollutant loads would exist with minimal to no impact from anthropogenic sources. To simulate the natural condition scenario, all anthropogenic land uses (urban/impervious, agriculture, transportation/utilities) were reverted to forest in the watershed model and the associated concentrations for nitrogen, phosphorus and BOD were used in the analysis.

## 6.F.2 TMDL CONDITION

### Comment ID S0401.001.024

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 6.f.2

13. Other than tabular summaries for the current and "natural" conditions, no modeling results are presented for BOD. Therefore, it is not possible to evaluate the recommended TMDLs for BOD.

**Response**

There was no comparison of model calibration to BOD because there is no BOD data in IWR Run 46 during the model simulation period.

## 6.G GENERAL/MISCELLANEOUS MODEL

### Comment ID S0101.001.003

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.g

<<The following comment was made in reference to the TMDLs for the Pithlachascotee River (WBID 1409) >>

3. There is a significant amount of information missing from the TMDL report regarding how the modeling was performed and, as such, a complete review of the model and its assumptions is not possible.

**Response**

The modeling report contains all necessary information about the performance of the model. Additionally, the model is available upon request as part of the administrative record for a full evaluation.

## Comment ID S0101.001.014

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.g

2. The report indicates that LSPC provided tributary flows and temperature to the EFDC estuary models and tributary water quality concentrations to WASP7 estuary models. No model inputs or coefficients were presented for any of these models. The report needs to provide a complete and comprehensive presentation of what went into the development of the models, including all physical, hydrologic, and chemical inputs and all relevant model coefficients. Referring to the models described in the recently completed Technical Support Document for EPA's Proposed Rule for Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters (July 2012) is not sufficient because the models described in that document were modified for this application.

### Response

The reference to these reports is adequate because the models utilize the same data sources as the larger models used for EPA's proposed Rule for Numeric Nutrient Criteria. The data sources utilized to develop the models has not changed. Additionally, there was no alteration to the flow calibration in the LSPC model. The model inputs and coefficients are available in the models themselves and are available upon request as part of the administrative record.

## Comment ID S0101.001.017

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.g

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

5. The WASP model segmentation and EFDC grid needs to be overlain upon a map or aerial of the watersheds. There is no discussion of how model segmentation and grid setup were performed nor what data were used in their construction.

### Response

No WASP or EFDC model was used to develop the Pithlachascotee River TMDL.

## Comment ID S0101.001.020

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 6.g

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409).>>

8. The model shows BOD concentrations for the existing condition drop to 1.0 mg/L, and the BOD concentrations for natural condition drop to 0.84 mg/L. These are very low values to simulate and are below detection limits. There is no identification if this is ultimate BOD or BOD5. Since the detection limit for BOD5 is generally around 2.0 mg/L and FDEP identifies thresholds for streams as having BOD problems when measurements are above 2.0 mg/L, these simulations are at such low values as to be unreasonable.

### Response

The modeled BOD is BOD5. The existing condition and natural condition model indicate that there is excessive BOD in the Pithlachascotee River that is impacting the DO concentrations.

## Comment ID S0201.001.002

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 6.g

2. There is a significant amount of information missing from the TMDL report regarding how the modeling was performed and, as such, a complete review of the model and its assumptions is not possible.

### Response

EPA believes that the modeling report was sufficient to describe what was done. A list of modeling inputs and coefficients is too long to be contained in the report. The administrative record for this TMDL contains all of the models and their associated input and output files. This information is available to the public upon request and may be reviewed at any time. The models for this TMDL utilized the same input data and assumptions as the model developed for the Numeric Nutrient Criteria.

## Comment ID S0201.001.013

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 6.g

2. The report indicates that LSPC provided tributary flows and temperature to the EFDC estuary models and tributary water quality concentrations to WASP7 estuary models. No model inputs or coefficients were presented for any of these models. The report needs to provide a complete and comprehensive presentation of what went into the development of the models, including all physical, hydrologic, and chemical inputs and all relevant model coefficients. Referring to the models described in the recently completed Technical Support Document for EPA's Proposed Rule for Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters (July 2012) is not sufficient since the models described in that document were modified for this application.

### Response

EPA believes that the modeling report was sufficient to describe what was done. A list of modeling inputs and coefficients is too long to be contained in the report. The administrative record for this TMDL contains all of the models and their associated input and output files. This information is available to the public upon request and may be reviewed at any time. The models for this TMDL utilized the same input data and assumptions as the model developed for the Numeric Nutrient Criteria. Any alterations to that model were referenced in the TMDL report.

## 7.E GENERAL/MISCELLANEOUS

## Comment ID S0401.001.023

**Author Name:** Hearn Janet

**Organization:** Applied Technology and Management, for Florida Department of Transportation (FDOT)

**Issue Category:** 7.e

<12, continued...> If the TMDL target is the DO daily average of 5.0 mg/L, then this should be stated at least once in the report, and the graphs should clarify that daily average is being shown.

**Response**

Comment noted. This correction has been made in the TMDL report.

## 9 WATER QUALITY DATA AND MONITORING

### 9.A WATER QUALITY MONITORING DATA

#### Comment ID S0101.001.011

**Author Name:** Leiva Ivette

**Organization:** Florida Department of Transportation (FDOT)

**Issue Category:** 9.a

<<The following comment was made in reference to the TMDL for the Pithlachascotee River (WBID 1409). See figure in original comment letter.>>

5. The lowest DO measurements were recorded during an extended dry period beginning in 2006 and ending mid to late 2009, according to USGS records. USGS data indicate that the WBID experiences extended periods of zero flow at the USGS monitoring station near New Port Richey. It is difficult to assess the conditions under which the DO measurements were made because all data from the 12 monitoring stations located in WBID 1409 are presented on one graph and flow information is not presented in the report.

**Response**

Please see the Response to Comment S0101.001.002. All DO measurements were considered when assessing the Pithlachascotee River and developing the TMDL, regardless of their location. The water quality data are available to the public in the Florida Department of Environmental Protection's Impaired Water Rules Database.